U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
10/089094	PCT/EP00/10175	221423US2PCT

24. The following fees are submitted:		CALCULATIONS PTO USE ONLY	
BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :			
☐ Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO	**$1040.00**		
☒ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO	**$890.00**		
☐ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO	**$740.00**		
☐ International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4)	**$710.00**		
☐ International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4)	**$100.00**		
ENTER APPROPRIATE BASIC FEE AMOUNT =		**$890.00**	
Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☒ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).		**$130.00**	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	- 20 =	0	x $18.00	**$0.00**	
Independent claims	- 3 =	0	x $84.00	**$0.00**	
Multiple Dependent Claims **(check if applicable)**.			☐	**$0.00**	
TOTAL OF ABOVE CALCULATIONS =				**$1,020.00**	
☐ Applicant claims small entity status. See 37 CFR 1.27). The fees indicated above are reduced by 1/2.				**$0.00**	
SUBTOTAL =				**$1,020.00**	
Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).			+	**$0.00**	
TOTAL NATIONAL FEE =				**$1,020.00**	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) **(check if applicable).**			☐	**$0.00**	
TOTAL FEES ENCLOSED =				**$1,020.00**	
				Amount to be: refunded	$
				charged	$

a. ☒ A check in the amount of **$1,020.00** to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. _____ in the amount of _____ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. **15-0030** A duplicate copy of this sheet is enclosed.

d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Surinder Sachar
Registration No. 34,423

22850

Surinder Sachar
SIGNATURE

Marvin J. Spivak
NAME

24,913
REGISTRATION NUMBER

April 12 2002
DATE

FORM PTO-1390 (Modified) (REV 11-2000) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER	
221423US2PCT	
U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR)	
10/089094	

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/EP00/10175	16 October 2000	14 October 1999

TITLE OF INVENTION
MOBILE ROUTE-MONITORING UNIT

APPLICANT(S) FOR DO/EO/US
BAUCH Horst H.

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include itens (5), (6), (9) and (24) indicated below.
4. ☒ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
   a. ☐ is attached hereto (required only if not communicated by the International Bureau).
   b. ☒ has been communicated by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
   a. ☒ is attached hereto.
   b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
   a. ☐ are attached hereto (required only if not communicated by the International Bureau).
   b. ☐ have been communicated by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
10. ☒ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).
11. ☐ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☒ A copy of the International Search Report (PCT/ISA/210).

Items 13 to 20 below concern document(s) or information included:

13. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☐ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
20. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
21. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
22. ☐ Certificate of Mailing by Express Mail
23. ☒ Other items or information:

Drawings (3 pages)/Form PTO-1449
Amended Sheets (pages 11 and 12)

221423US-2 PCT

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :

HORST H. BAUCH : ATTN: APPLICATION DIVISION

SERIAL NO: 10/089,094 :

FILED: April 12, 2002 :

FOR: MOBILE ROUTE MONITORING UNIT

PRELIMINARY AMENDMENT

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

SIR:

Prior to a first examination on the merits, please amend the above-identified application as follows:

IN THE CLAIMS

Please cancel Claims 1-9 without prejudice.

Please add new Claims 10-18 as follows:

10. (New) Mobile route monitoring unit comprising:

a data memory configured to store route data with tolerance data;

a position sensor configured to indicate a position of the mobile route-monitoring unit;

a processor configured to indicate possible route deviations between a route defined by the route data and a current position of the route monitoring unit; and

a transmitter, which in an event of a route deviation, is configured to send a message to a control unit;

wherein the route data represents the route in a form of coordinates and assigned route vectors, and the tolerance data exists as authorized deviation values in a vertical direction of a next route vector, whereby a length of the route vectors and the authorized deviation values for all route vectors can be selected depending on the route and can be adjusted to the route.

11. (New) Mobile route monitoring unit according to Claim 10, wherein the transmitter communicates by a GSM network voice channel.

12. (New) Mobile route monitoring unit according to Claim 10, further comprising a data reception device to receive preset route data.

13. (New) Mobile route monitoring unit according to Claim 12, wherein the data reception device includes a reader configured to read data from a changeable storage medium.

14. (New) Mobile route monitoring unit according to Claim 12, wherein the data reception device includes a receiver configured to communicate by a voice channel of a GSM network.

15. (New) Mobile route monitoring unit according to Claim 10, further comprising an input to receive preset route data.

16. (New) Mobile route monitoring unit according to Claim 10, wherein the position sensor includes a GPS receiver.

17. (New) Mobile route monitoring unit according to Claim 10, wherein the stored route data can be changed at any time.

18. (New) Route monitoring system, comprising:

a mobile route monitoring unit according to Claim 10,

wherein the route monitoring system comprises a device to process the route data.

19. (New) Route monitoring system comprising:

a mobile route-monitoring unit according to Claim 10,

wherein the route monitoring system comprises a receiver assigned to the transmitter.

IN THE ABSTRACT

Please amend the Abstract on page 13 to read as follows:[1]

ABSTRACT

A mobile route monitoring unit including a data store, which stores predefined route data, a position sensor, which determines the position of the mobile route monitoring unit, a processor, which determines possible deviations from a route defined by the route data, a permissible route, and the actual position of the unit and a transmitter, which in the event of a deviation from the route sends a signal to a center. The above-mentioned elements form a mobile unit that enables self-sufficient route monitoring to be performed, which can accordingly occur locally, i.e., executed by the mobile route monitoring unit. The necessity of transmitting cost incurring signals at regular intervals becomes superfluous. Non-permissible route deviations are rapidly determined and are securely communicated by sending a signal to the center. The utilization of a permissible and defined region instead of the route is also realized.

[1]A marked-up copy of the amendments is attached hereto.

REMARKS

Favorable consideration of this application, as presently amended, is respectfully requested.

The present preliminary amendment is submitted to place the above-identified application in more proper format under United States practice.

By the present preliminary amendment original Claims 1-9 are cancelled and new Claims 10-18 are presented for examination. New Claims 10-19 are deemed to be self-evident from the original disclosure, including cancelled Claims 1-9, and thus are not deemed to raise any issues of new matter. Further, new Claims 10-19 are not believed to be more narrow in scope in any aspect in comparison with cancelled Claims 1-9.

The Abstract has also been amended by the present response to be in more proper format under United States practice.

The present application is believed to be in condition for a full and thorough examination on the merits. An early and favorable consideration of the present application is hereby respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.

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221423US-2 PCT

Marked-Up Copy
Serial No:
10/089,904
Amendment Filed on:
8-12-2002

IN THE CLAIMS

--1-9. (Cancelled).

10-18. (New).

ABSTRACT

[The invention relates to a] A mobile route monitoring unit [comprising] including a data store, which stores predefined route data, a position sensor, which determines the position of the mobile route monitoring unit, a processor, which determines possible deviations from a route defined by [said] the route data, a permissible route, and the actual position of the unit and a transmitter, which in the event of a deviation from the route sends a signal to a center. [Combination of the] The above-mentioned elements [to] form a mobile unit that enables self-sufficient route monitoring to be performed, which can accordingly occur locally, i.e., executed by the mobile route monitoring unit. The necessity of transmitting cost incurring signals at regular intervals becomes superfluous. Non-permissible route deviations are rapidly determined and are securely communicated by sending a signal to the center. The [invention also relates to the] utilization of a permissible and defined region instead of [said] the route is also realized.--

THE FOLLOWING IS THE ENGLISH TRANSLATION OF THE ANNEXES TO THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT : AMENDED SHEETS (Pages 11 and 12).

Claims

1. Mobile route monitoring unit (2) with data memory (6) to store present route data with tolerance data;
a position sensor (3) to indicate the position of the mobile route-monitoring unit (2);
a processor (5) to indicate possible route deviations between the route (1') defined by the route data and the current position of the route monitoring unit (2); and
a transmitter (4), which in the event of a route deviation sends a message to a control room (7) wherein
the route data represent the route (1') in the form of coordinates and assigned route vectors, and the tolerance data exist as authorized deviation values in the vertical direction of the next route vector, whereby the length of the route vectors (1') and the values of authorized deviation for all route vectors can be selected depending on the route and can be adjusted to same.
2. Mobile route monitoring unit (2) according to Claim 1, wherein the transmitter (4) communicates via the GSM network voice channel.
3. Mobile route monitoring unit (2) according to one of the previous claims, wherein the mobile route monitoring unit (2) comprises a data reception device or input to receive the preset route data.
4. Mobile route monitoring unit (2) according to Claim 3, wherein the data reception device is a reader which can read data from a changeable storage medium.
5. Mobile route monitoring unit (2) according to Claim 3, wherein the data reception device is a receiver which communicates via the voice channel of the GSM network.

AMENDED PAGE

6. Mobile route monitoring unit (2) according to one of the previous claims, wherein the position sensor (3) is a GPS receiver (3).

7. Mobile route monitoring unit (2) according to one of the previous claims, wherein the stored route data can be changed at any time.

8. Route monitoring system (2, 7) including a mobile route monitoring unit (2) according to one of the previous claims, wherein the system (2, 7) comprises a device to process the route data.

9. Route monitoring system (2, 7) including a mobile route-monitoring unit (2) according to Claims 1 through 10, wherein the system (2, 7) comprises a receiver assigned to the transmitter (4).

AMENDED PAGE

Description

Mobile Route-Monitoring Unit

The invention relates to a mobile route-monitoring unit, to be used in particular in a truck.

Every shipping company is faced with the problem of comparing the current location of its trucks and their cargoes with a planned route and schedule. The foregoing is necessary to identify any tardiness or theft/seizure as early as possible.

Previously, this problem was successfully solved by a transmission unit installed in the truck sending current location information to the control room at certain time or distance intervals determined by a GPS receiver or a gyrosensor. The previous method for transmitting information was using a mobile phone network Short Message Service, because the costs of sending messages via SMS are substantially lower than voice mobile communications. The position message was processed at the control room and compared with the planned route and time data, which in the event of a route deviation set off an alarm.

Frequently, an "authorized area" system is used to define a route deviation; in this system the planned route is represented as a series of consecutive ellipses, which cover the planned route plus minor lateral deviations. Staying outside the "authorized" consecutive ellipses is considered a route deviation. An example of this type of route representation is shown in Fig. 3.

Fig. 3 shows a route 1 and a number of ellipses 10 which cover the route and taken together establish an ample "authorized route corridor." Typically, the traveled route is measured using an odometer in the truck and a position message is sent to the control room via SMS service, for example every 10 km. Such messages are represented in the figure by message points 9A, 9B and 9C.

This type of system has many disadvantages. For example, the truck has to send confirmation signals at regular intervals, which results in high costs. This is especially true for foreign travel, because SMS messages cost significantly more abroad than domestically. That explains why the intervals between confirmation signals tend to be large. Which in turn leads to a substantial increase in the size of the probable location at any given moment. This problem is also shown schematically in Fig. 3: Circle 11. Circle 11 has a radius r, of, for example, 10 km, at message point 9B. The shaded area of Circle 11 therefore represents the "unauthorized" area in which a vehicle can be located which is moving along the route on schedule at message point 9B. In general, a route representation using "authorized" elliptical areas produces an uneven route corridor that allows and/or prohibits widely divergent deviations. In Fig. 3, for example, the authorized deviation A from message point 9A to the west (in Fig. 3 north is indicated using the usual cartographic convention) is substantially smaller than the authorized deviation B from message point 8A to the east.

The fact that SMS service is currently available in about only 40% of Europe results in an additional, considerable limitation to the possibility of monitoring.

Accordingly, the purpose of the invention is to avoid the abovementioned disadvantages of the current technology and to achieve the advantages described below.

To meet these objectives, the invention provides a mobile route-monitoring unit according to Claim 1. Preferred applications of the invention are specified in the subclaims.

The invention comprises four essential components, which together form a mobile route-monitoring unit:

- a data memory, which stores the preset route data;
- a position sensor which determines the position of the mobile route monitoring unit;
- a processor which determines any route deviations between the route defined by the route data and the unit's actual position; and
- a transmitter, which sends a message to the control room in the event of a route deviation.

Although the components of the invention form a unit, this does not have to exist in a physical sense. The components of the invention can, if necessary, also exist as separate modules connected electronically to the unit. Preferably, the mobile route monitoring unit is attached, if necessary in a non-detachable manner, to or in a carrier whose position is to be monitored, for example a truck, a container, an airplane, ship, etc.

Combining the above components into a mobile route-monitoring unit makes possible autonomous route monitoring, which can be performed on site, i.e. on the carrier. The above eliminates the need to transmit cost-generating signals at regular intervals. However, a route deviation will be determined quickly, and securely reported to the control room by transmitting a signal.

Since signals do not have to be transmitted at regular intervals, it is possible to use a transmitter when transmission costs are of lesser importance and transmission quality and/or availability are of greater importance. Such a transmitter (optionally using a matching receiver, despite the fact that the following will mention only a "transmitter," as the specialist will be able to tell the difference) can also perform other communications services between the carrier of the mobile unit and/or a person or device assigned to this carrier (for example: driver, captain, motor or control device) and the control room or to another location. For example, as needed, a voice channel can be established between a driver or cab and a control room via the transmitter. In the event of a conspicuous route deviation, the above could be used to initiate an acoustic monitoring of the cab without being heard in the cab. Similarly, a text message could be sent between a driver and a control room using a keyboard or display in conjunction with the transmitter. Also, visual and operating data and/or information could be exchanged using the transmitter. That way control commands could be received which are meant for the mobile route monitoring unit, the carrier or a device assigned to the carrier. For example, in the event of theft or seizure of the vehicle, a control command to the vehicle electronics could be used to disable the vehicle. A control command to the mobile route-monitoring unit could be used to update the route data stored in the data memory.

Preferably, the processing of the route data from the planned route is performed by an external device using a physically or electronically stored map or chart, for example in a

PC located at the control room. The route data could then be used according to methods known to specialists to, for example, transmit to the data memory of the route-monitoring unit via modem, line-of-sight radio, transmitter, or cable. In this instance, specialists weigh convenience, availability and investment costs. A cable connection is cost effective and can be set up in many locations. For example, a radio link enables easy data transfer. However, to update route data, the route monitoring unit according to the invention could also contain a reader to read a portable storage medium, such as a CD, a floppy disk or a memory card, etc., on which the route data is stored.

It is, however, also the purpose of the invention that route data can be called up or processed or calculated in the unit, for example using departure or arrival data which can be entered by keyboard or other entry device. Such an application is useful in particular where the route repeatedly traverses given sections or parts of sections. Route data can be updated at any time, though this is done preferably when the carrier of the route-monitoring unit is at a loading yard. If necessary, data can be updated by a limited range modem with a frequency and power that does not require a separate license.

According to the invention, the route-monitoring unit also comprises a position sensor which determines the route monitoring unit's current position. Preferably, a GPS receiver is used as a position sensor, although other position indicating arrangements known to specialists can also fulfill this purpose, such as a wheel, acceleration or gyrosensor evaluation or similar method. It can also be advantageous to indicate the route monitoring unit's position using a redundant system consisting of a number of position determining devices and in which the results of the position determining devices can be matched, if necessary, to increase directional precision.

The route-monitoring unit according to the invention stores route data in the provided data memory. The route data reproduce the planned, released route [or route course] in such a way that this can be compared with the position data generated by the position

sensor. These position data reflect the current position of the route-monitoring unit, which may be mounted on a carrier. The comparison in the route-monitoring unit is made by a processor provided for that purpose.

Preferably, the route is represented as a sequence of consecutive coordination points and associated vectors. Accordingly, the route data consists of pairs of vector data and coordinate data, whereby the coordinate data can be the same as or similar to those of a GPS. Figure 2 shows this kind of route representation. It is advantageous to place the coordinate points close together to insure precise route reproduction and therefore rapid recognition of any deviation. However, to match the route the coordination points can use different spacing. In the vector representation of the route according to the invention the coordinate points of straight sections can be placed further apart than those in curved sections without negatively impacting the precision of section reproduction. By thus reducing the amount of route data the route monitoring unit's data memory can be utilized in an optimum fashion.

Typically, a deviation from the route is measured vertically from the next route vector or, if necessary, as radius from the next route coordinate. The allowable deviation can be either a fixed value or dependant on the route section or the route. In the event of a route tolerance varying depending on the route section, preferably selected route data will be stored along with tolerance data which define the allowable deviation of the route section. Thus, for example, the route tolerance can be increased in a curved section to reduce the number of coordinate points needed to represent a route/section.

Integrating a timer device into the route monitoring unit according to the invention allows monitoring of compliance with the route by spatial but also by time criteria. Specifically, time information can be stored with the route data, which indicates the earliest and/or latest times when given coordinate points should be reached. The data from the timer device can also be used to identify the speed of the route-monitoring unit. Such measures can be used to ensure, for example, that a delivery schedule is kept

without violating laws concerning speed, stops, etc. Breakdowns and improper stops can also be determined this way.

The invention can also be produced as a system, which in addition to the route-monitoring unit described above comprises additional components physically separate from the route-monitoring unit.

For example, such a system can comprise the abovementioned external apparatus to input and process route data or a receiver assigned to the transmitter or receiver/transmitter device.

An application of the invention is described below in greater detail using drawings:

Fig. 1 A route monitoring unit according to a first application;

Fig. 2 Route monitoring according to a preferred application of the invention;

Fig. 3 Route monitoring according to the current state of the art.

Figure 1 shows a route monitoring unit according to the invention 2 with a storage unit 6, a position sensor 3, a processor 5 and a transmitter 4, which can, if desired, send data to a control room 7. According to the first application, the position of the route-monitoring unit is determined by a GPS receiver as position sensor; route data is stored in a RAM 6 and processed in a CPU 5. According to the first application, the route-monitoring unit 2 is installed in the cab of a truck 8.

According to a preferred application of the invention, a planned route 1 is reproduced by vector data, which are stored as route data in storage unit 6 of the route-monitoring unit. As represented schematically in Figure 2, the individual vectors which are shown graphically in Figure 2 as a point and an arrow can be stored or configured consecutively to define a route simulation 1' of the actually planned route 1. The points of the aforementioned coordination points and the arrows represent the [respectively] associated vectors.

Above all, the simulation of route 1 within route monitoring unit 2 has the advantage of being able to frequently or constantly check the current position of route monitoring unit 2 and/or its carrier 8 without entailing high communications costs. The foregoing makes it possible to keep route monitoring unit 2 from leaving a narrowly authorized

route corridor 12 around route simulation 1' without such a deviation from the planned route 1 being recognized quickly.

Typically, the authorized route corridor 12 extends from the beginning of the route to the indicated route end. However, the authorized route corridor can be limited to a selectively calculated route section. An additional temporal limitation of the authorized location of route monitoring unit 2, as described above, can result in the authorized route corridor 12 being dynamically cut in length. That means that the length of the authorized route corridor 12 is dynamically updated using the stored route time information and/or the currently or previously measured position data of route monitoring unit 2, and thereby limited to a given current route section.

The GPS receiver 3 determines the position of route monitoring unit 2 and/or the position of the carrier 8 carrying route monitoring unit 2. The position information thus acquired is processed in CPU 5 and/or compared with a route simulation 1' of the planned route 1 produced from route data stored in storage unit 6. If necessary, the spatial check of route compliance is supplemented, as described above,

with a route compliance check based on temporal standards. If an unauthorized route deviation is found by route monitoring unit 2, an appropriate message will be sent to the control room 7. Preferably, this message is sent via the voice channel of the GSM network, i.e. the global system for mobile communications, an international mobile telephone and data network.

It is further advantageous to equip the route-monitoring unit with a receiver which also uses the GSM network to be able to set up an interactive voice channel between the cab and the control room.

Preferably, the route monitoring unit also comprises a 433 MHz modem as data reception device which can be used to load current route data from the transmitters or data processing apparatus in the respective loading yards to storage unit 6.

The applications and utilization methods given as examples in the Description are merely intended to provide examples of what the specialist understands or could understand as equivalent in the respective context, and which under [given] circumstances he could use in place of the enumerated examples. Such equivalents are thus as much a part of the invention as the explicitly enumerated, incomplete examples.

Claims

1. Mobile route monitoring unit (2) with
   data memory (6) to store present route data;
   a position sensor (3) to indicate the position of the mobile route-monitoring unit (2);
   a processor (5) to indicate possible route deviations between the route (1') defined by the route data and the current position of the route monitoring unit (2); and
   a transmitter (4), which in the event of a route deviation, sends a message to a control room (7).

2. Mobile route monitoring unit (2) according to Claim 1, wherein the transmitter (4) communicates via the GSM network voice channel.

3. Mobile route monitoring unit (2) according to one of the previous claims, wherein the mobile route monitoring unit (2) comprises a data reception device or data reception input to receive the preset route data.

4. Mobile route monitoring unit (2) according to Claim 3, wherein the data reception device is a reader which can read data from a removable storage medium.

5. Mobile route monitoring unit (2) according to Claim 3, wherein the data reception device is a receiver which communicates via the voice channel of the GSM network.

6. Mobile route monitoring unit (2) according to one of the previous claims, wherein the position sensor (3) is a GPS receiver (3).

7. Mobile route monitoring unit (2) according to one of the previous claims, wherein the route data represent the route (1') in the form of coordinates and associated vectors.

8. Mobile route monitoring unit (2) according to Claim 7, wherein the represented distances between the coordinates can vary.

9. Mobile route monitoring unit (2) according to one of the previous claims, wherein the route data comprises tolerance data which indicate the authorized route deviation.

10. Mobile route monitoring unit (2) according to one of the previous claims, wherein the stored route data can be changed at any time.

11. Route monitoring system (2, 7) including a mobile route monitoring unit (2) according to one of the previous claims, wherein the system (2, 7) comprises a device to process the route data.

12. Route monitoring system (2, 7) including a mobile route-monitoring unit (2) according to Claims 1 through 10, wherein the system (2, 7) comprises a receiver assigned to the transmitter (4).

Abstract

The invention relates to a mobile route monitoring unit comprising a data store, which stores predefined route data, a position sensor, which determines the position of the mobile route monitoring unit, a processor, which determines possible deviations from a route defined by said route data, a permissible route and the actual position of the unit and a transmitter, which in the event of a deviation from the route sends a signal to a center. Combination of the above-mentioned elements to form a mobile unit enables self-sufficient route monitoring to be performed, which can accordingly occur locally, i.e. executed by the unit. The necessity of transmitting cost incurring signals at regular intervals becomes superfluous. Non-permissible route deviations are rapidly determined and are securely communicated by sending a signal to the center. The invention also relates to the utilization of a permissible and defined region instead of said route.

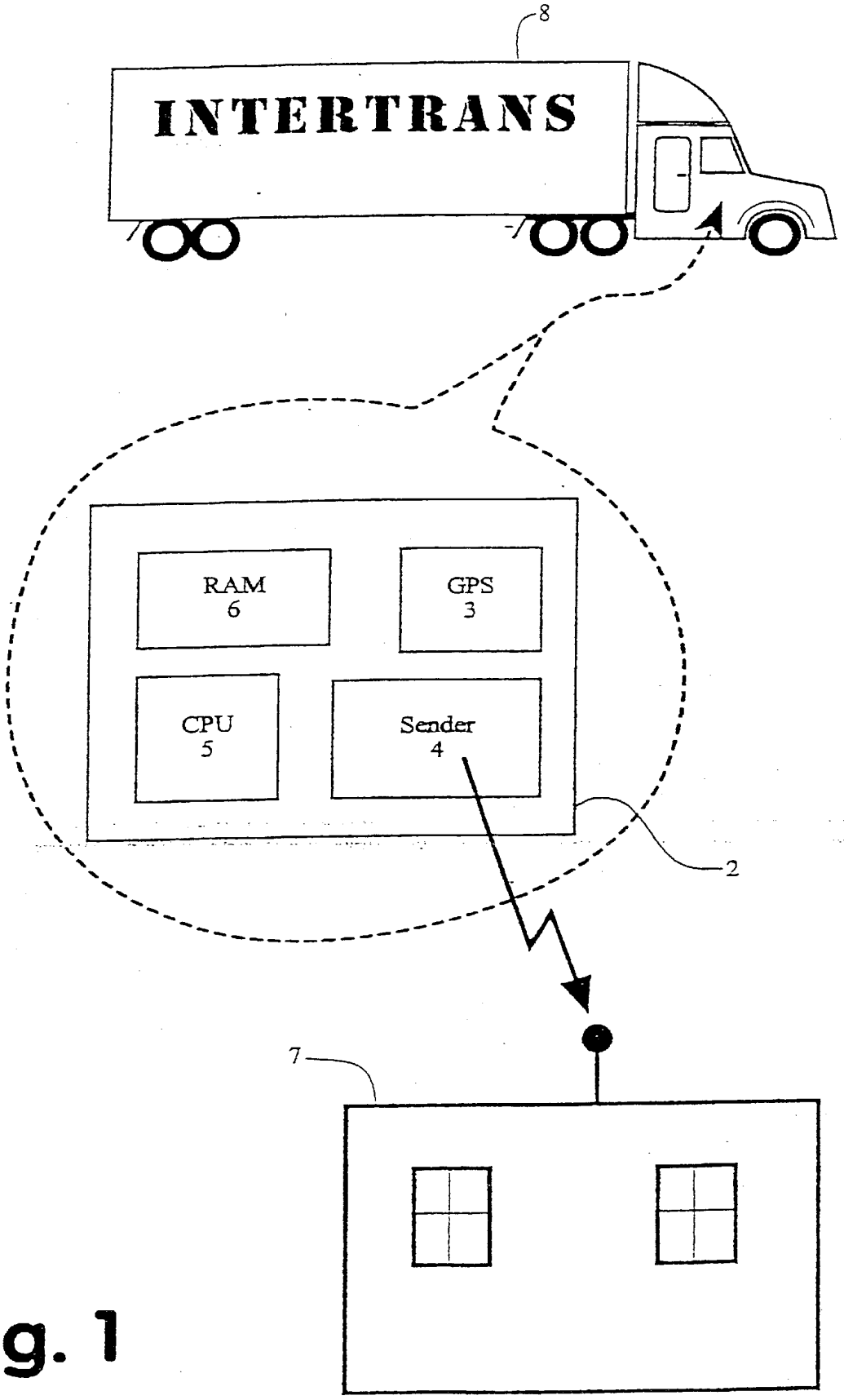


Fig. 1

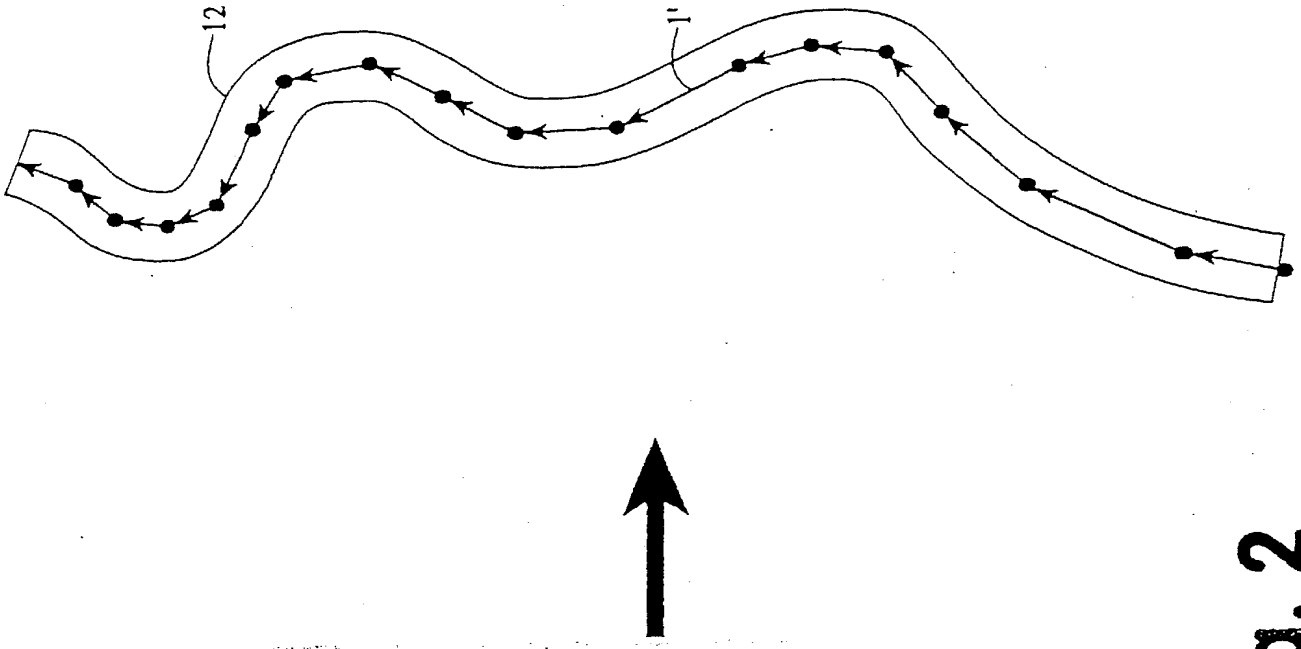
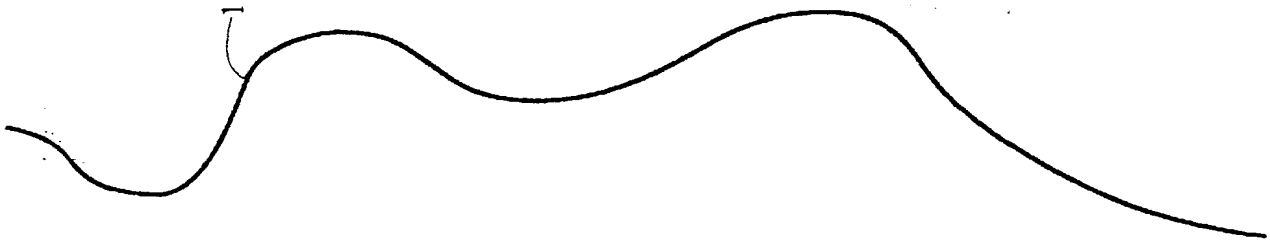


Fig. 2



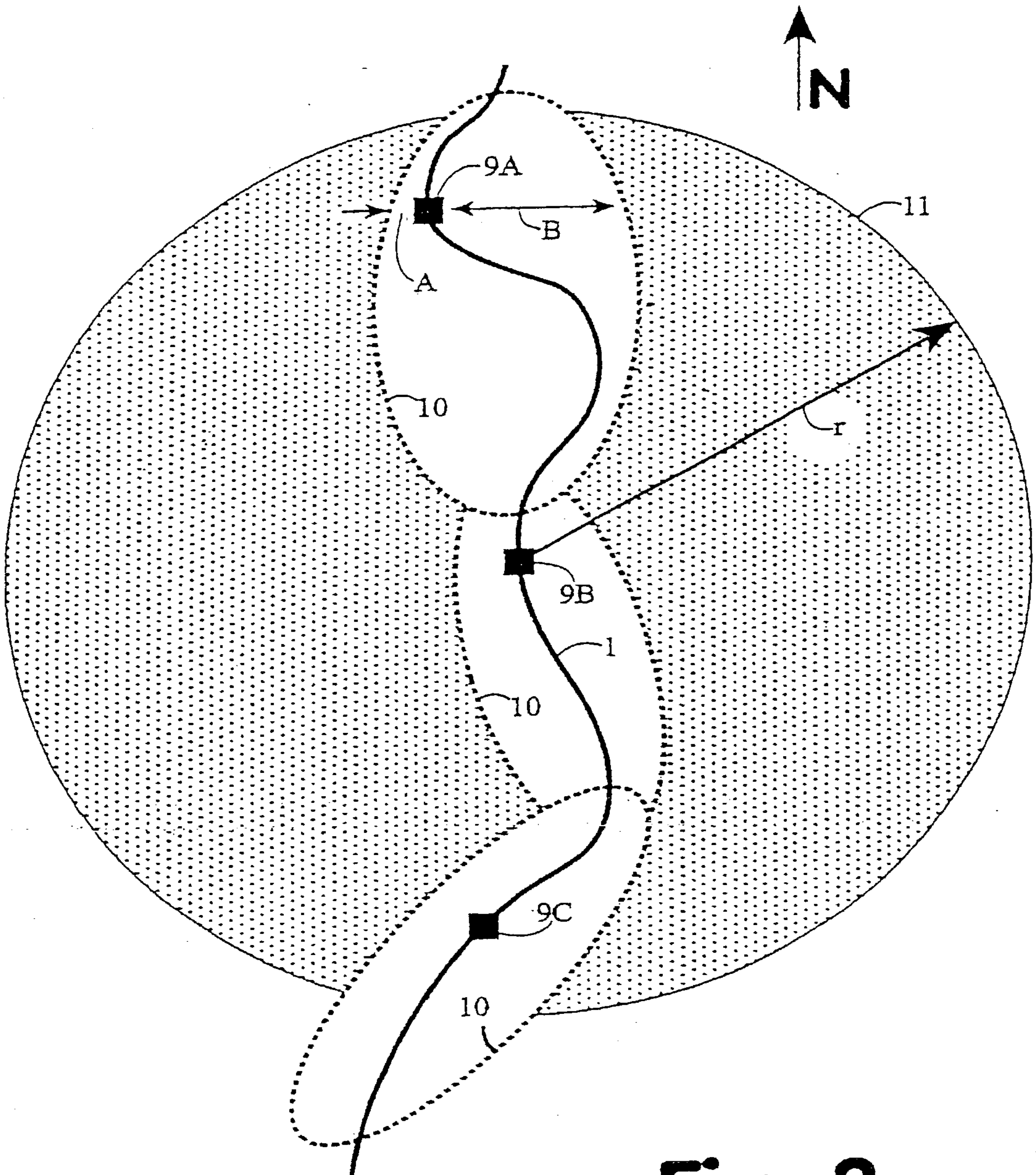


Fig. 3

Docket No. 221423US2PCT

Declaration and Power of Attorney for Patent Application
Erklärung für Patentanmeldungen mit Vollmacht
German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

daß mein Wohnsitz, meine Postanschrift und meine Staatsangehörigkeit den im nachstehenden nach meinem Namen aufgeführten Angaben entsprechen, daß ich nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent für die Erfindung mit folgendem Titel beantragt wird:

Deren Beschreibung:

☐ ist beigefügt

☐ wurde angemeldet am _____

unter der US-Anmeldenummer oder unter der Internationalen Anmeldenummer im Rahmen des Vertratgs über die Zusammenarbeit auf dem Gebiet des Patentwesens (PCT)

_____ und am

_____ Abgeändert (falls zutreffend).

Ich bestätige hiermit, daß ich den Inhalt der oben angegebenen Patentanmeldung, einschließlich der Ansprüche, die eventuell durch einen oben erwähnten Zusatzantrag abgeändert wurde, durchgesehen und verstanden habe.

Ich erkenne meine Pflicht zur Offenbarung jeglicher Informationen an, die zur Prüfung der Patentfähigkeit in Einklang mit Titel 37, Code of Federal Regulations, § 1.56 von Belang sind.

As a below named inventor, I hereby declare that:

My residence, mailing address and citizenship are as stated next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled.

MOBILE ROUTE MONITORING UNIT

the specification of which

☐ is attached hereto.

☒ was filed on April 12, 2002

as United States Application Number or PCT International Application Number

10/089,094 and was amended on

_____ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

German Language Declaration

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäß Title 35, US-Code, § 119(a)-(d), bzw. § 365(b) aller unten aufgeführten Auslandsanmeldungen für Patente oder Erfinderurkunden, oder § 365(a) aller PCT internationalen Anmeldungen, welche wenigstens ein Land ausser den Vereinigten Staaten von Amerika benennen, und habe nachstehend durch ankreuzen sämtliche Auslandsanmeldungen für Patente bzw. Erfinderurkunden oder PCT internationale Anmeldungen angegeben, deren Anmeldetag dem der Anmeldung, für welche Priorität beansprucht wird, vorangeht.

I hereby claim foreign priority under Title 35, United States Code, § 119 (a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s) (Frühere ausländische Anmeldungen)			Priority Claimed Priorität beansprucht	
199 49 622.6 (Number) (Nummer)	Germany (Country) (Land)	14 October 1999 (Day/Month/Year Filed) (Tag/Monat/Jahr der Anmeldung)	☒ Yes Ja	☐ No Nein

Ich Beanspruche hiermit Prioritätsvorteile unter Title 35, US-Code, § 119(e) aller US-Hilfsanmeldungen wie unten aufgezählt.

I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below.

(Application No.) (Aktenzeichen)	(Filing Date) (Anmeldetag)

(Application No.) (Aktenzeichen)	(Filing Date) (Anmeldetag)

Ich beanspruche hiermit die mir unter Title 35, US-Code, § 120 zustehenden Vorteile aller unten aufgeführten US-Patentanmeldungen bzw. § 365(c) aller PCT internationalen Anmeldungen, welche die Vereinigten Staaten von Amerika benennen, und erkenne, insofern der Gegenstand eines jeden früheren Anspruchs dieser Patentanmeldung nicht in einer US-Patentanmeldung, bzw. PCT internationalen Anmeldung in in einer gemäß dem ersten Absatz von Title 35, US-Code, § 112 vorgeschriebenen Art und Weise offenbart wurde, meine Pflicht zur Offenbarung jeglicher Informationen an, die zur Prüfung der Patentfähigkeit in Einklang mit Title 37, Code of Federal Regulations, § 1.56 von Belang sind und die im Zeitraum zwischen dem Anmeldetag der früheren Patentanmeldung und dem nationalen oder im Rahmen des Vertrags über die Zusammenarbeit auf dem Gebiet des Patentwesen (PCT) gültigen internationalen Anmeldetags bekannt geworden sind.

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

(Application No.) (Aktenzeichen)	(Filing Date) (Anmeldetag)	(Status: Patented, Pending, Abandoned) (Status: patentiert, schwebend, aufgegeben)
PCT/EP00/10175	October 16, 2000	

(Application No.) (Aktenzeichen)	(Filing Date) (Anmeldetag)	(Status: Patented, Pending, Abandoned) (Status: patentiert, schwebend, aufgegeben)

Ich erkläre hiermit, daß alle in der vorliegenden Erklärung von mir gemachten Angaben nach bestem Wissen und Gewissen der Wahrheit entsprechen, und ferner daß ich diese eidesstattliche Erklärung in Kenntnis dessen ablege, daß wissentlich und vorsätzlich falsche Angaben oder dergleichen gemäß § 1001, Title 18 des US-Code strafbar sind und mit Geldstrafe und/oder Gefängnis bestraft werden können und daß derartige wissentlich und vorsätzlich falsche Angaben die Rechtswirksamkeit der vorliegenden Patentanmeldung oder eines aufgrund deren erteilten Patentes gefährden können.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

German Language Declaration

VERTRETUNGSVOLLMACHT: Als benannter Erfinder beauftrage ich hiermit den (die) nachstehend aufgeführten Patentanwalt (Patentanwälte) und/oder Vertreter mit der Verfolgung der vorliegenden Patentanmeldung sowie mit der Abwicklung aller damit verbundenen Angelegenheiten vor dem US-Patent- und Markenamt: *(Name(n) und Registrationsnummer(n) auflisten)*

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: (list name and registration number)

022850

Postanschrift

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Vor- und Zuname des einzigen oder ersten Erfinders	Full name of sole or first inventor Horst H. BAUCH
Unterschrift des Erfinders — Datum 21 June 2002	Inventor's signature — Date June 21, 2002
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